

1. (Amended) An anti-wear compound comprising:
reacting a first moiety with a second moiety in a molar ration of from about 1:2 to about 2:1 at a temperature of from about 22°C to about 320°C under an inert atmosphere to form an intermediate adduct;

esterfying the intermediate adduct with a third moiety in a molar ratio of from about 1:2 to about 2:1 wherein the first moiety is an unsaturated synthetic base oil or an unsaturated synthetic dieneophilic base oil, the second moiety is a structure having a diene conjugated carbon-carbon double bond and a carboxylic acid or anhydride moiety, and the third moiety is a polyhydroxy compound.

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10. (Thrice Amended) The anti-wear compound of claim 1 wherein the anti-wear compound is made from the first moiety, second moiety and third moiety compounds selected from the group consisting of respectively in order for each anti-wear compound trimethylol propane trioleate -maleic anhydride-sorbitol, trimethylol propane trioleate -sorbital-sorbate, and trimethylol propane trioleate -maleic anhydride-hydroquinone. ⁶

36. (New) An anti-wear compound comprising:
reacting a first moiety with a second moiety in a molar ration of from about 1:2 to about 2:1 at a temperature of from about 22°C to about 320°C under an inert atmosphere to form an intermediate adduct;

esterfying the intermediate adduct with a third moiety in a molar ratio of from about 1:2 to about 2:1 wherein the first moiety is an unsaturated synthetic base oil or an unsaturated synthetic dieneophilic base oil, the second moiety is a structure having a diene conjugated carbon-carbon double bond and a carboxylic acid or anhydride moiety, and the third moiety is a polyhydroxy compound and wherein the anti-wear compound is made from the first moiety, second moiety and third moiety compounds selected from the group consisting of respectively in order for each anti-wear compound trimethylol propane trioleate -maleic anhydride-sorbitol, trimethylol propane trioleate -maleic anhydride-sorbate, and trimethylol propane trioleate -maleic anhydride-hydroquinone. ¹¹²

RESPONSE

This Preliminary Amendment is responsive to the Office Action dated March 5, 2001.

Claims 1-35 are pending in the present application. Claims 1 and 10 have been amended by this Amendment. Claim 36 has been added by this Amendment.

Applicants respectfully disagree with the Examiner's rejection of the claims under 35 U.S.C. §§ 102 and 103. Nonetheless, Applicants have elected to amend claims 1 and 10 solely for the purpose of expediting the patent application process in a manner consistent with the Patent and Trademark Office's Patent Business Goals (PBG), 65 Fed. Reg. 54603 (September 8, 2000). Claims 1, 10, and 36 as now presented contain only those limitations of originally filed claims 1 and 10. Therefore, this Amendment does not narrow the scope of the claims within the meaning of *Festo*.

1. AMENDMENT TO THE SPECIFICATION

Page 7 of the application contained duplicative sentences. The Applicants have amended page 7 to remove the duplicities.

2. AMENDMENT TO CLAIMS UNDER 35 U.S.C. § 112

The Examiner objected to claim 10 as being indefinite for allegedly not clearly pointing out the members of the Markush grouping. For reasons of clarity unrelated to patentability, the Applicants have amended claim 10 to overcome this objection.

3. REJECTIONS UNDER 35 U.S.C. § 103

The Examiner rejected claims 1-9 and 11-19 under 35 U.S.C. Section 103(a) as being unpatentable over Urushibata et al (5,304,316) in view of Funahaski et al (4,696,869) and Lindermann (3,322,703). Urushibata is to a de-inking compound and fails to teach or disclose at least the carboxylic acid and carboxylic acid anhydride of the second moiety and arguably at best discloses a diene. Urushibata discloses the use of POE/POP which arguably at best is the diene of the second moiety but fails completely to disclose the carboxylic acid or the carboxylic acid anhydride in the type of reaction (Diels-Alders) occurring in claim 1 with a dieneophile or unsaturated base.

The specification of the present application clearly discloses that the first moiety and the second moiety are involved in the Diels-Alders reaction. Claim 11 explicitly recites the formation of an intermediate adduct "in a Diels-Alder reaction." The Diels-Alder's reaction does

not take place in the Urushibata.

Further, and most strikingly, one skilled in the art would not look to the non-analogous art of de-inkers for the claimed anti-wear compound. The Applicants respectfully assert that the Examiner is basing her rejection on completely non-analogous art. The combination of references is improper if one of the references is non-analogous art. *In re Clay* (CAFC 1992) 966 F.2d 656, 23 USPQ 2d 1058. A person skilled in the art would not have reasonably consulted the patents cited by the Examiner in seeking a solution to the problem the Applicants were attempting to solve (*In re Wood* (CCPA 1979) 599 F.2d 1032, 202 USPQ 171)—that of an anti-wear compound, as the preamble is directed.

The Applicants respectfully direct the Examiner's attention to MPEP Section 2141(a) wherein the inapplicability of non-analogous art when making a rejection to the claims under 35 U.S.C. 103 is discussed. As a first indication that all the patents (Urushibata, Funabashi, and Lindermann) are all in non-analogous arts, is the fact that they are in different group art units than the present application. Further, while above the Applicants briefly discussed that Urushibata is directed to a de-inker, Lindermann is directed to "remoistenable adhesive materials and gummed sheet materials and gummed products having an adhesive coating capable of developing adhesive tackiness when moistened with water" (Column 1, lines 11-14); particularly, the invention is directed to "gummed labels, postage stamps, and envelopes" (Column 1, lines 31-32). One skilled in the art would not look to a patent on how to make sticky paper products to solve the need for "lubricity additives that impart needed lubricity properties but provide minimal ash or preferably ash-less properties for the purposes of reducing ultimate pollution and emission characteristics" (page 2, lines 5-7 of the application as filed).

Further, Funabashi is directed to "a magnetic recording medium having improved durability at an elevated temperature" (Column 1, lines 5-7); particularly "magnetic disks, magnetic tapes and magnetic sheets" (Column 1, lines 8-9). One skilled in the art would not look to a patent on how to make magnetic disks, tapes, and sheets to solve the need for "lubricity additives that impart needed lubricity properties but provide minimal ash or preferably ash-less properties for the purposes of reducing ultimate pollution and emission characteristics" (page 2, lines 5-7 of the Application as filed). The Applicants respectfully assert that the patents cited against claim 1 are non-analogous art and therefore do not render obvious claim 1, or any claim dependent therefrom.

The Examiner rejected claims 20-35 under 35 U.S.C. Section 103(a) as being unpatentable over Urushibata et al (5,304,316) in view of Funahaski et al (4,696,869) and Lindermann (3,322,703) as applied to claims 1-9 and 11-19 above and further in view of Zehler (4,601,840). The Applicants respectfully traverse this rejection.

As stated immediately above, the initial inapplicability of Urushibata et al (5,304,316), Funahaski et al (4,696,869), and Lindermann (3,322,703) cannot be overcome by the addition the disclosure of Zehler.

Initially, as stated above with respect to claims 1-9 and 11-19 and incorporated here, Urushibata et al (5,304,316), Funahaski et al (4,696,869), and Lindermann (3,322,703) are non-analogous art. Either alone or in combination they can not render claims 20-35 unpatentable under 35 U.S.C. Section 103(a).

In the Office Action of April 28, 2000, the Examiner cites Zehler as "teaching" a lubricant composition comprising a base oil carrier and other conventional additives and notes Column 5, line 39 through Column 6, lines 1-52. These portions of Zehler are directed towards the formation of the synthetic ester that is then reacted with a polyisobutylene to yield a mist lubricant. (See column 2, lines 43-54 and Column 2, line 68 through Column 3, lines 1-29). Even the reaction between compounds disclosed in the reactions described in the formation of the synthetic ester from the polyol at Column 5, line 39 through Column 6, lines 1-52 fail to teach or disclose at least the claimed second moiety of "a compound having a diene conjugated carbon-carbon double bond and a carboxylic acid moiety or anhydride group" as claimed in claims 20 and 28. Since none of the references teach the anti-wear compound claimed, the disclosure of certain "additives" in Zehler (apparently cited by Examiner at Columns 8, lines 61 to Column 9 line 64) cannot render the claim obvious.

The Examiner rejected claims 1-8 and 11-35 under 35 U.S.C. §103 as unpatentable over three Hayashi patents ('194, '955 and '573). The Examiner has alleged that various noted sections "disclose and teach reaction additives, process for producing said additives, [and] reaction additive supplemental composition lubricant composition comprising said additive. Applicants respectfully traverse this rejection and note that none of the three patents disclose or suggest the claimed (product-by-process) anti-wear compound rendering moot the issues of additive package and lubricant composition.

The Hayashi patents all relate to "olefin polymer substituted carboxylic acid acylating agents." The first moiety in Hayashi is not the first moiety in the present invention because there is no carboxylic acid group in the first moiety. Hayashi does not disclose the second moiety reacted (under claimed reaction conditions) with the first moiety. Hayashi does not disclose esterification with the third polyol moiety. Therefore, other than providing many pages of unrelated detailed chemistry of a different reaction with different reactants, applicants do not understand where Hayashi discloses or suggests the claimed anti-wear compound. In looking at the claimed product-by-process, one has to compare reactants and processes. Neither reactant comparisons nor process step comparisons makes sense in the three Hayashi references. Withdrawal of this rejection is respectfully requested.

The Examiner rejected claims 1-6, 11-16 and 20-24 as unpatentable under 35 U.S.C. §103 over LeSuer. The Examiner makes the same comments with respect to LeSuer as made with Hayashi with a bunch of reference citations. Applicants traverse this rejection because LeSuer is irrelevant to the claimed invention and does not disclose or suggest the claimed anti-wear compound.

In its broadest embodiment in column 1, LeSuer discloses a "composition" (*i.e.*, mixture of compounds) of a hydroxyamine (having the formula shown) and a "hydrocarbon-soluble carboxylic dispersant." Neither element of the LeSuer composition is the claimed anti-wear compound characterized by the process. The dispersant elements are further described in Table 1 and the Examiner notes several Table 1 entries. None of the dispersants in Table 1 disclose or suggest the anti-wear compound in claim 1 because none describe the two step reaction using the three moieties. Therefore, if the Examiner is alleging that the LeSuer dispersants disclose or suggest the claimed anti-wear compound, there is a big gap in the chemistry, including different reactants and a missing second reaction. Accordingly, LeSuer does not disclose or suggest the claimed anti-wear compounds. The remaining claims are similarly patentable over LeSuer in view of the lack of disclosure of their additional formulation elements. Withdrawal of this rejection is respectfully requested.

4. REJECTIONS UNDER 35 U.S.C. § 102

The Examiner rejected claims 1-9 and 11-27 under 35 U.S.C. §102 as anticipated by or under 35 U.S.C. §103 as obvious over Baillargen. Applicants traverse this rejection because the

one step reaction disclosed in B is not the same as the two-step claimed product-by-process.

The broadest embodiment of Baillargen can best be seen in column 2 lines 13-60 (one of the few parts of Baillargen not referenced by the Examiner). There "core" and "pendent group" are defined and summarized as "reaction products obtained by combining the core structure and the pendent group(s) in different ratios using standard techniques for esterification/amidification." Cores are described as "two or more reactive carboxyl groups." "Suitable pendent groups are alcohols and amines with some combination of linear hydrocarbyl groups attached." Therefore, translating the language of the Baillargen reference, the first moiety is not disclosed or suggested, the first reaction is not disclosed or suggested and the second reaction is missing the product of the first reaction (with alcohols being a "core" in Baillargen and a third moiety (if a polyol) in the claimed invention). In summary, comparing the Baillargen product-by-process with the inventive product-by-process does not yield very much overlap as the inventive first step is missing and the product of the first step (not surprisingly) is not disclosed or suggested in the one step disclosed in Baillargen. Therefore, Baillargen does not disclose all of the elements of claim 1 and does not anticipate the present invention. Moreover, Baillargen does not suggest those missing elements such that Baillargen does not render unpatentable the claimed invention. Withdrawal of this rejection is respectfully requested.

The Examiner rejected claims 1-9 and 11-27 under 35 U.S.C. Section 102(b) as anticipated by LeSuer. Applicants respectfully traverse this rejection for the reasons stated above with regard to Table 1 of LeSuer.

The claimed product-by-process is the result of a two step reaction. Table 1 discloses a one step reaction. There are specific reaction moieties in the claimed invention. Table 1 in LeSuer does not disclose any of the required moieties. Therefore, the disclosure in LeSuer does not come close to anticipating the claimed invention. Withdrawal of this rejection is respectfully requested.

5. NOTICE OF ALLOWABLE SUBJECT MATTER

Applicant gratefully acknowledges the recitation by the Examiner that claim 10 would be allowable if re-written to remove any duplicity and to include sorbate. Pursuant to the Examiner's suggestion, Applicants have amended claim 10. As claim 10 depends from an allowable base claim, and in view of the Examiner's recitation of claim 10's allowability,